In re Patent Application of
STORM ET AL.
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In the Specification:

Please replace paragraph [00010] on page 3 with the following rewritten paragraph:

~~The invention provides an image sensor as defined in claim 1, and a method of calibrating an image sensor as defined in claim 10. Preferred features and advantages of the invention will be apparent from the other claims and from the following description.~~

In view of the foregoing background, an object of the present invention is to calibrate a logarithmic pixel.

This and other objects, advantages and features in accordance with the present invention are provided by an image sensor comprising an array of pixels, with each pixel comprising a photodiode, and a semiconductor device connected to the photodiode and operating based upon a sub-threshold for providing a signal that is proportional to a logarithm of light intensity on the photodiode.

A calibration circuit may apply a voltage having a constant rate of change across a capacitance within the pixel for producing a constant current within the pixel. Each pixel may further comprise a switching device between the photodiode and the semiconductor device. The switching device may be operable during calibration for isolating the photodiode from the semiconductor device.

The calibration circuit may comprise an amplifier having an inverting input for receiving the signal from the semiconductor device, a non-inverting input for receiving a reference voltage, and an output for providing a pixel output signal. The reference voltage may be a ramp voltage for providing the voltage having the constant rate of change. The

ramp voltage may also be applied at a beginning of an image-capturing operation of the pixel. The image sensor may further comprise a feedback loop between the output of the amplifier and the semiconductor device for controlling the semiconductor device.

The semiconductor device may comprise a transistor comprising a conducting terminal, wherein the capacitance is provided by a capacitance of the conducting terminal and a capacitance of the inverting input of the amplifier.

Another aspect of the present invention is directed to a method for calibrating an image sensor operating in a logarithmic mode. The image sensor may comprise an array of pixels, with each pixel comprising a photodiode, a semiconductor device connected to the photodiode, and a calibration circuit connected to the semiconductor device. The method may comprise applying a voltage having a constant rate of change across a capacitance within each respective pixel for producing a constant current within the pixel during calibration.